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BIPHENYL

Microfiche # 206426

Document ID #

1A

OFFICE OF TOXIC SUBSTANCES REV. 7/27/82

CODING FORM FOR GLOBAL INDEXING

Microfiche No. (7) •	206426	1	No. of Pages	2			
Doc I.D.	8782136800	3	Old Doc I.D.	8DS	4		
Case No.(s)	OTS 8400 3A	5					
Date Produced (6)	6	Date Rec'd (6)	7	Conf. Code •	8		
050549		062483		N			

Check One: ☐ Publication ☐ Internally Generated ☑ Externally Generated

Pub/Journal Name	9
	9
Author(s)	10
Organ. Name: UNION CARBIDE CORP	11
Dept/Div: CORP HEALTH SAFETY & ENVIR AFF	12
P.O. Box	13
Street No./Name: OLD RIDGEBURY RD	14
City: DANBURY	15
State: CT	16
Zip: 06817	17
Country	18
MID No. (7)	19
D & B NO. (11)	20
Contractor: MELLON INST	21
Doc Type: • RI • UP • HEASD SD SUHS FN	22
Doc Title: RANGE FINDING TESTS ON DIPHENYL TABLES OF PROTOCOLS ATTACHED WITH COVER LETTER	23

Chemical Name (300 per name)	25	CAS No. (10)	24
BIPHENYL		92-52-4	

ce 9/483

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UNION CARBIDE CORPORATION OLD RIDGEBURY ROAD, DANBURY, CT 06817
Corporate Health, Safety and Environmental Affairs Department

June 28, 1983

U.S. Environmental Protection Agency
TSCA 8D-1
P.O. Box 2060
Rockville, Maryland 20852

Subject: Union Carbide TSCA Sec. 8(d) Report
40 CFR 716.6 & 716.7

Sirs:

With respect to:

Chapter I of Title 40 of the Code of Federal Regulations;
Subpart A, Secs. 716.6 and 716.7;
As amended 716.17(a)(3), Federal Register Vol. 48, p. 13181,
March 30, 1983;
Sec. 8(d), Pub. L. 94-469, Stat. 2029 (15 U.S.C. 2607 (d);

Union Carbide Corporation herewith submits the attached copies of studies and lists of studies in compliance with the above-identified regulation.

There is no information in the enclosed copies of studies or lists of studies for which Union Carbide asserts claims of confidentiality. The printed words "BUSINESS CONFIDENTIAL" or "Confidential" at the top of pages for some reports was for the internal guidance of Union Carbide personnel at the time of report issuance and does not represent a Union Carbide Corporation claim for confidential handling of the information, submitted pursuant to TSCA Sec. 8(d) rules.

Where some lines are deleted from certain reports, especially earlier ones, it is solely due to the fact that the deleted information pertains to chemicals or substances other than those for which reporting is required under the above rule. Union Carbide has included copies and lists of studies for only those chemical substances that are members of categories which it has manufactured or processed since 1972. Union Carbide Corporation believes that the enclosed copies of studies and lists of studies represent all of the studies which Union Carbide's file search has identified to date as reportable under the above-identified rule. Should any reportable studies be discovered subsequently, they will be forwarded immediately.

The Environmental Protection Agency and other appropriate government agencies are free to use the enclosed information as necessary in the normal discharge of their mandated responsibilities. However, identified authors, whether employees of Union Carbide or elsewhere, or their organizations are the rightful owners of the publication rights to the contained information.

If you have questions concerning the enclosed reports and lists of studies or wish to request further basic underlying data pertinent to the studies, please contact me or Dr. Donald L. Heywood (203-794-5224) of this Department.

Very truly yours,

Jackson B. Browning, Director
Health, Safety and Environmental
Affairs (203) 794-5227

JBB/DLH/cr
Enclosure

ID

Confidential

Biphenyl
4.a.

Rec 5-5-49
LHS 5/6/49

Report 12-41

MELLON INSTITUTE OF INDUSTRIAL RESEARCH

UNIVERSITY OF PITTSBURGH

SPECIAL REPORT

Number copies made 80

Number copies mailed 16 by MPC

on

Date of mailing 5-10-49

Addressed to

Range Finding Tests on Diphenyl

Tables of Protocols Attached

Carbide and Carbon Chemicals Corporation Industrial Fellowship 274-12

Summary

Diphenyl is a compound of moderate acute oral toxicity for rats with an R.F. LD_{50} value of 2.18 (1.39 to 3.42) gm./kg. This result relegates the compound to the same oral toxicity grade as phenyl "Cellosolve".

The high boiling point and heat stability of this compound are reflected in the results of the exposure of rats to substantially saturated vapor, and to mists evolved at 170° C. Neither type of exposure was lethal to rats exposed for 8 hour periods.

A 10% solution in acetone is not irritating to rabbit skin and a 15% solution in mineral oil causes only trace injury to the cornea of the rabbit eye.

Sample

The Eastman Kodak Company product identified by number 721 was procured on 1-26-49 for this toxicity investigations made for the HN project.

Single Oral Doses

The R. F. LD_{50} is 2.18 (1.39 to 3.42) gm./kg. for male albino Sherman strain rats of 90 to 120 gm. weight range fed a 20% suspension in lard by stomach tube without preliminary starving. Following the doses the rats exhibited symptoms of sluggishness, prostration, and narcosis. Death was delayed several days after the administration of a dosage of 3.98 gm./kg. Diphenyl is a member of the same oral toxicity grade as is phenyl "Cellosolve".

Skin Penetration

Because of the solid nature of this compound this test was omitted.

Inhalation

Substantially saturated vapor at room temperature, prepared by aerating a column packed with diphenyl and glass beads, was not lethal to rats in an 8 hour exposure. These animals gained weight well in the 14 day observation period.

Similarly, a group of 6 rats survived an 8 hour exposure to a mist produced by aerating the compound while it was heated at 170° C. in a bath of silicone.

Irritation

No irritation of the skin of the rabbit belly is produced by a 10% acetone solution of diphenyl.

A 15% solution in mineral oil caused only trace injury to the cornea of the rabbit eye when instilled in 0.5 ml. amounts.

Charles P. Carpenter

Charles P. Carpenter
SENIOR INDUSTRIAL FELLOW

Typed: May 5, 1949 - mrc

Table 12-79

DIPHENYL

Single Doses to Male Albino Rats by Mouth

Fed by Stomach Tube as a Suspension in Lard, 1 ml. = 0.20 grams.

Rat No.	Date Dosed	Grams Wt.	Weight Change in 14 Days	Dosage; Grams per Kilo	Dose in Grams	Dose in ml. of Suspension	Days to Death
86787	2-17-49	100	-	7.95	0.795	4.0	1
87153	"	94	-	7.95	0.747	3.7	0
86875	"	116	-	7.95	0.922	4.6	1
86865	"	118	-	7.95	0.938	4.7	1
86873	"	114	-	7.95	0.906	4.5	2
86870	2-17-49	112	-	3.98	0.446	2.2	2
86872	"	106	-	3.98	0.422	2.1	3
87144	"	98	-	3.98	0.390	1.9	2
87145	"	100	-	3.98	0.398	2.0	2
87149	"	116	-	3.98	0.462	2.3	2
86555	2-21-49	112	-	2.00	0.224	1.10	1
86532	"	110	0	2.00	0.220	1.10	-
86530	"	106	+ 60	2.00	0.212	1.10	-
86529	"	98	+ 58	2.00	0.196	0.98	-
86551	"	108	+ 52	2.00	0.216	1.10	-
86554	2-21-49	116	-	1.00	0.116	0.58	10
86310	"	110	+ 40	1.00	0.110	0.55	-
86208	"	108	+ 44	1.00	0.108	0.54	-
86237	"	106	+ 42	1.00	0.106	0.53	-
86246	"	96	+ 52	1.00	0.096	0.48	-

OFFICE OF TOXIC SUBSTANCES — REV. 7/27/82

CODING FORM FOR GLOBAL INDEXING

Microfiche No. (7) • 1	206426
No. of Pages 2	
Doc I.D. 3	878213681
Old Doc I.D. 4	8DS
Case No.(s) 5	OTS 84003A
Date Produced (6) 6	1/11/2/1/1
Date Rec'd (6) 7	062483
Conf. Code • 8	N

Check One: ☐ Publication ☐ Internally Generated ☑ Externally Generated

Pub/Journal Name 9	—
9	—
Author(s) 10	—
Organ. Name 11	UNION CARBIDE CORP
Dept/Div 12	CORP HEALTH SAFETY & ENVIR AFF
P.O. Box 13	—
Street No./Name 14	OLD RIDGEBURY RD
City 15	DANBURY
State 16	CT
Zip 17	06817
Country 18	—
MID No. (7) 19	—
D & B NO. (11) 20	—
Contractor 21	MELLON INST
Doc Type 22	• 2 I • U P • H E A S D 8D. SU H S F N
Doc Title 23	RANGE FINDING TESTS ON DIPHENYL, REFINED

Chemical Name (300 per name) 25	CAS No. (10) 24
BIPHENYL	92-52-4

Confidential

Report 24-88

Biphenyl
4.b.

R: 10-12-61
GdW 10/13/61

878213681

MELLON INSTITUTE OF INDUSTRIAL RESEARCH

SPECIAL REPORT

Range Finding Tests on Diphenyl, Refined

Union Carbide Chemicals Co., U.C.C. Industrial Fellowship 274-24

Summary

Stomach Intubation, rat - LD_{50} = 3.73 gm./kg., 10% in corn oil.
Skin Penetration, rabbit - LD_{50} = 2.50 gm./kg., 25% in dimethyl phthalate. Slight necrosis.
Inhalation, rat -
Mist, vapor, and any decomposition products evolved at approximately 160°C.
8 hours killed 0 of 6.
Uncovered Skin Irritation, rabbit - none from 10% in acetone.
Eye Injury, rabbit - none from 25% in dimethyl phthalate.

Refined diphenyl (95%) is moderately toxic by the peroral and skin penetration routes but poses no hazard by inhalation at room temperature or when heated to 160°C. Neither corneal injury nor uncovered skin irritation result from solutions of 25% in dimethyl phthalate and 10% in acetone respectively.

In 1948, a sample of diphenyl of unknown purity was studied (Report 12-41). The results obtained then are in substantial agreement with current results obtained on the purified sample.

Sample

On April 18, 1961, one-pint of diphenyl, refined, was received from Institute, West Virginia for toxicological evaluation upon the request of Dr. C. U. Dernehl. This sample is from current plant production (Tank 1~35, High Pressure Hydrogenation Dept., April 11, 1961) and is approximately 95% pure diphenyl.

Single Peroral Doses

Refined diphenyl has a single dose LD_{50} of 3.73 (2.68 to 5.21) gm./kg. when administered as a 10% solution in corn oil to male albino rats by stomach intubation.

Carworth Farms-Elias non-fasted rats, five to six weeks of age and 90-120 grams in weight were dosed at levels differing by a factor of 2.0 in a geometric series. The rats were reared in our own colony and maintained from time of weaning on Rockland rat diet (complete). The method of moving average for calculating the median-effective dose (LD_{50}) was applied to the 14-day mortality data.

Deaths occurred on the first and second day after dosing. Gross examination at autopsy revealed congestion of the lungs and the abdominal viscera plus mottling of the livers.

Skin Penetration

By rabbit skin penetration, the LD_{50} is 2.50 (1.14 to 5.48) gm./kg. as a 25% solution in dimethyl phthalate. These covered applications produced marked erythema and slight necrosis of the skin.

Male albino New Zealand strain rabbits, three to five months of age and averaging 2.5 kg. in weight were immobilized during the 24-hour skin contact period. Thereafter, the VINYLITE sheeting used to retain the dose in contact with the clipped skin of the trunk was removed and the animals were caged for the remainder of the 14-day observation period. The rabbits were procured locally and maintained on Rockland rabbit ration. The moving average method of calculating the LD_{50} was used.

Deaths were delayed for three and six days after application of the chemical. At autopsy, gross pathological examination disclosed cherry-red lungs, mottled livers with acini prominent, and pale kidneys. In one animal, the kidneys were enlarged with spots of hemorrhage discernible.

Inhalation

Mist, vapor, and any decomposition products, evolved by passing air at the rate of 2.5 liters/minute through a fritted glass disc immersed to a depth of one inch in 50 ml. of refined diphenyl contained in a bubbler which in turn was submerged in a silicone bath held at approximately 176°C., caused no mortality among six CFE, female albino rats after an 8-hour period. The temperature of the chemical never exceeded 166°C. while the air within the 9-liter inhalation chamber averaged about 27°C. All animals gained weight well during the subsequent two-week observation period and no gross pathology was found at sacrifice on the 14th day.

Irritation

Uncovered application of 0.01 ml. amounts of a 10% solution of refined diphenyl in acetone to clipped skin of the rabbit belly caused no reaction on five animals.

Five rabbit eyes were unharmed by the instillation of an excess (0.5 ml.) of a 25% solution in dimethyl phthalate.

Jean A. Striegel

Jean A. Striegel
JUNIOR FELLOW

Charles P. Carpenter
ASSISTANT ADMINISTRATIVE FELLOW

Charles P. Carpenter
Individual Responsibilities
Jean A. Striegel, B.S., Junior Fellow — Editor; Peroral Doses
Naomi I. Condra, B.S., Junior Fellow — Skin Penetration; Irritation
Charles C. Haun, B.S., Research Associate — Inhalation
Typed: October 12, 1961 - md

Table 24-269

Diphenyl, Refined (24-84)

Single Doses to Male Albino Rats Fed by Stomach Tube

as Solution in Corn Oil, 1 ml. = 0.10 gm.

Rat Number	1961 Date Dosed	Grams Weight	Weight Change in 14 Days	Dosage; Grams Per Kilo	Dose in Grams	Dose in Ml. of Solution	Days to Death
30804	5-2	99	-	8.0	0.792	7.9	1
30795	5-2	110	-	8.0	0.880	8.8	1
30802	5-2	105	-	8.0	0.840	8.4	1
30786	5-2	114	-	8.0	0.912	9.1	1
30731	5-2	112	-	8.0	0.896	9.0	1
29626	4-25	93	-	4.0	0.372	3.7	2
29624	4-25	117	-	4.0	0.468	4.7	2
31621	5-16	95	-	4.0	0.380	3.8	2
29677	4-25	120	+ 63	4.0	0.480	4.8	-
29712	4-25	116	+ 80	4.0	0.464	4.6	-
29625	4-25	99	+ 8	2.0	0.198	2.0	-
29621	4-25	108	+ 68	2.0	0.216	2.2	-
29661	4-25	110	+ 83	2.0	0.220	2.2	-
29665	4-25	115	+ 84	2.0	0.230	2.3	-
29595	4-25	111	+ 74	2.0	0.222	2.2	-
29604	4-25	109	+105	1.0	0.109	1.1	-
29600	4-25	110	+ 77	1.0	0.110	1.1	-
29602	4-25	103	+ 74	1.0	0.103	1.0	-
29605	4-25	107	+ 92	1.0	0.107	1.1	-
29603	4-25	107	+ 81	1.0	0.107	1.1	-

LD_{50} = 3.73 (2.68 to 5.21) gm./kg.

Table 24-270

Diphenyl, Refined (24-84)

Single Doses to Male Albino Rabbits by Skin Penetration
Administered as a Solution, 1 ml. = 0.25 gm. in
Dimethyl Phthalate Under VINYLITE Dam for 24 Hours

Rabbit Number	1961 Date Clipped	1961 Date Applied	Grams Weight	Weight Change in 14 Days	Dosage; Grams Per Kilo	Dose in Grams	Dose in Ml. of Solution	Days to Death
28838	5-17	5-18	2410	-	2.5	6.025	24.1	6
28872	5-31	6-1	2114	-	2.5	5.285	21.1	3
28837	5-17	5-18	2438	+142	2.5	6.095	24.4	-
28873	5-31	6-1	2704	+380	2.5	6.760	27.0	-
28874	6-5	6-6	2822	- 60	1.25	3.528	14.1	-
28878	6-5	6-6	2804	+286	1.25	3.505	14.0	-
28881	6-5	6-6	2434	+300	1.25	3.042	12.2	-
28906	6-5	6-6	2372	+458	1.25	2.965	11.9	-

LD_{50} = 2.50 (1.14 to 5.48) gm./kg.

Table 24-271

Diphenyl, Refined (24-84)

Single Inhalation by a Group of Female Albino Rats of Mist,
Vapor, and Any Decomposition Products Evolved at
a Temperature of Approximately 100°C.

Rat Number	Date and Duration of Inhalation	Initial Weight Grams	Weight Change in 14 Days
38253		131	+51
38255	8-22-61	129	+65
38267	8 Hours in	126	+62
38270	9-Liter	129	+61
38286	Chamber	126	+50
38287		131	+55

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